

**RECEIVED  
CENTRAL FAX CENTER****JAN 02 2008**Docket: 204/505 US  
Applic.: 10/590,180IN THE UNITED STATES PATENT AND TRADEMARK OFFICEIn Re Application of:  
Ralph J. KoernerExaminer : Durham, Nathan E.  
Art Unit : 3765

Applic.: 10/590,180

Filed: 08/22/2006

Response to Office Action (10/15/2007)

For: STITCHING METHOD AND APPARATUS  
USING FRAME WITH MOTION DETECTORREMARKS

Please amend the claims as shown in the attached Claims List.

The Office Action dated 10/15/07 has been carefully considered. It is noted that original claims 1-16 have been rejected under 35 U.S.C. 102(b) or 103(a) based primarily on the cited Ebata U.S. Publication 2001/0050036 (now U.S. Patent 6,470,813). It is respectfully urged that Ebata lacks teachings relevant to the specific "free motion" stitching problem addressed by Applicant and accordingly fails to suggest the method and apparatus, as recited in Applicant's claims, for solving the problem. Favorable reconsideration is respectfully requested.

Conventionally operated sewing machines include a feed mechanism, i.e., feed dogs, which typically engage a fabric workpiece, or stack, to move the stack along a planar bed surface past a needle reciprocating at a rate synchronized with the feed dogs to thus produce uniform length stitches. Applicant's invention relates to "free motion" stitching which refers to a technique in which the feed dogs are disabled to permit the user to freely manually move the fabric across the bed surface to enable the user to artistically produce a wide variety of decorative stitch patterns. When practicing free motion stitching, an expert user is able to synchronize his/her hand, i.e., manual, movement of the fabric with the needle cycle rate, controlled via a user foot pedal, to achieve uniform length stitches. However, many less

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1 skilled users are unable to sufficiently coordinate their hand and foot motion to produce  
2 uniform length stitches when free motion stitching. The problem addressed by the present  
3 invention is how to enable such "less skilled" users to produce uniform length stitches while  
4 engaging in free motion, i.e., manually guided, stitching.

5 Applicant's parent application 10/776,355 (now U.S. Patent 6,883,446) addresses the  
6 aforestated problem by describing an apparatus including a detector for directly detecting the  
7 movement of the fabric stack to automatically synchronize the needle speed with the stack  
8 movement to thus achieve uniform length stitches. Said parent application primarily  
9 contemplates that the user directly grasp the stacked layers to push/pull the stack across the  
10 planar bed. However, the application also recognizes that the user could mount the stack on  
11 a frame and then manually grasp the frame to move the stack across the bed. The new  
12 matter introduced into this CIP application is primarily depicted in Figures 9-13 and is directed  
13 to alternative implementations for producing uniform length stitches while practicing free  
14 motion stitching. More particularly, the embodiments introduced in this application include a  
15 frame for mounting the fabric stack. The frame is supported beneath the stitch head needle  
16 for movement attributable solely to the user's manual effort, i.e., using the hands to push/pull  
17 the stack. A detector is associated with the frame to produce signals representing the  
18 magnitude of frame movement which signals are used by control circuitry to control needle  
19 cycle rate.

20 The cited Ebata reference has been carefully studied and as a consequence it is clear  
21 that it lacks any teachings relating to free motion stitching and the production of uniform  
22 length stitches. That is, Ebata describes an embroidery system in which a frame carrying the  
23 fabric is moved in the X-Y direction solely as a consequence of its motor drive elements 65,  
24 66, 67. The motor drive elements are controlled by CPU 50 "in accordance with the programs  
25 stored in program memory 51".

26 Applicant respectfully disagrees with the Office Action assertion that "EBATA discloses  
27 means... supporting said frame for manually guided movement". For the Ebata system to

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1 function effectively, the frame movement must be controlled solely by the CPU 50.  
2 Any manual movement imposed by a user would interfere with the programmed operation of  
3 the Ebata system and seriously compromise its performance.

4 Accordingly, it is submitted the Office Action errs in asserting with respect to Ebata that  
5 "It is inherent in the structure as shown in the art that the guided movement is manual guided  
6 movement because the user is always involved in the sewing process. For example, the user  
7 can push/pull the frame..." It is urged that user action to push/pull the frame is clearly  
8 inconsistent with the teachings of Ebata of having the CPU 50 precisely and solely control  
9 frame movement.

10 Dictionaries typically define "manual" as referring to something "operated or done by  
11 hand rather than automatically or electronically". Thus, Applicant has used terminology such  
12 as "manually guided movement" (e.g., claim 1) to express that the user is able "to push/pull  
13 the frame 300 to manually guide the frame over surface 310" (see specification paragraph  
14 046). Applicant's terminology should be given its "plain meaning" in construing the claims  
15 (MPEP, Section 2111.01) and thus the Ebata frame cannot reasonably be considered as  
16 being mounted for "manually guided" movement. Indeed any such manually guided  
17 movement must be avoided in Ebata for his apparatus to operate in its intended manner.

18 In view of the foregoing, favorable reconsideration of Applicant's claims is respectfully  
19 requested.

20 Independent claim 1 has been amended to recite in the preamble an apparatus for free  
21 motion stitching and for inserting uniform length stitches through a stack as the stack is  
22 manually guided along a substantially horizontal plane. This recitation provides clear context  
23 for claim construction (MPEP, Section 2111.02) and readily differentiates the invention over  
24 Ebata. Claim 1 additionally recites structural elements including a frame configured to retain  
25 a fabric layer stack, a bearing supporting said frame for manually guided movement to move  
26 the stack across a first planar surface, a detector for producing signals representing the  
27 translational movement of said frame, and control circuitry responsive to said signals

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1 indicating a translational movement exceeding a threshold magnitude for causing the needle  
2 to execute a cyclic movement.

3 Neither Ebata nor any other prior art reference known to Applicant suggests this  
4 combination of mounting a frame for free motion manually guided movement and control  
5 circuitry responsive to such frame movement for controlling needle cycling. Accordingly,  
6 favorable reconsideration and allowance of independent claim 1 is courteously requested.

7 Independent claim 8 recites a method of forming successive uniform length stitches  
8 while performing free motion stitching. The method steps include mounting a fabric stack on  
9 a frame, manually moving the frame to guide the stack across a planar surface, and actuating  
10 a stitch head in response to a threshold magnitude of frame movement. Independent claim  
11 10 is similar to claim 8 but differently recites the step of controlling the stitch head needle. As  
12 previously noted, Ebata fails to suggest a method of manually moving a frame to guide a  
13 fabric stack beneath a stitch head and controlling stitch head actuation in response to such  
14 frame movement. Accordingly, favorable reconsideration and allowance of independent  
15 claims 8 and 10 is courteously requested.

16 Independent claim 11 is similar to claim 1 but differently recites the control circuitry to  
17 express that the needle executes cyclic movements at a rate substantially proportional to the  
18 rate of frame movement. Clearly Ebata lacks any suggestion of controlling needle execution  
19 as a function of freely manually guided frame movement. Accordingly, favorable  
20 reconsideration and allowance of independent claim 11 is courteously requested.

21 Independent claim 12 recites a frame, means for securing a fabric stack to the frame,  
22 and bearing means mounting said frame for free motion hand guided movement. Claim 12  
23 also recites detector means for producing signals representing the frame movement and  
24 means for coupling the signals to a drive subsystem to synchronize needle cycle rate to frame  
25 movement. As previously urged, Ebata nowhere suggests such a combination.

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1 In view of the foregoing, favorable reconsideration and allowance of all remaining  
2 claims 1 and 3-16 is respectfully requested.  
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Respectfully submitted,



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